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CHAL-0603

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18 March 1959

MEMORANDUM FOR: Deputy Director (Plans)

SUBJECT : K-Band Intercept Receiver and ALQ-28 for [redacted]

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1. The facts and the views set forth below have been developed in consultation with representatives of Research and Development Branch/DPD-DD/P ([redacted]), Operations Branch/DPD-DD/P ([redacted]), and the ELINT Staff Officer [redacted]. This paper is stimulated by your memorandum of 10 March to Major [redacted] on the subject of [redacted] "Program" (reference: DD/P 4-4449).

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K-Band Intercept Receiver

2. The K-band intercept receiver is an electronically-tuned superhetrodyne (20 sweeps per second) receiver covering the frequency range of 10,000 to 40,000 megacycles per second. This range is covered in two bands. The receiver will provide frequency determination for signals within its tuning range and will reject signals outside its range. It will provide sufficient fidelity to allow reproduction of signals expected in the 10 to 40 KMC band; i.e., signals with a pulse width of a fraction of a microsecond. The sensitivity expected is of the order of minus 60 to 70 dbm which is sufficient to provide reception out to a distance of 200-300 miles, assuming reasonable antenna gains, transmitter power, and line of sight.

3. This equipment could be installed and used in any medium to large size aircraft that has manned ELINT collection facilities. The equipment in its present form is not usable for unattended operation, but with modification could be so utilized. In addition, it could be miniaturized and modified for use in [redacted]. This capability would have specific applicability (either as is or miniaturized) for:

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a. [redacted] penetrations or peripheral at 1,500 feet -- 50 miles on either side; at 10,000 feet. Line of sight -- 140 miles.

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This document contains information  
relating to the [redacted] [redacted]

SECRET

2

CHAL-0603

b. RB-47 -- peripheral -- at 40,000 feet -- 275 miles line of sight.

[REDACTED]

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The equipment could also be used from land.

[REDACTED]

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5. There is no equipment in the US inventory that will accomplish the same task as this equipment. There are wide open crystal video systems in being for this range, but owing to their extreme lack of sensitivity and selectivity are not capable of providing even an indication of the presence of a signal. This equipment represents the first K-band airborne receiver in this country capable of intercepting and analyzing signals in this range.

6. Status of contract:

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a. [REDACTED] estimated originally for delivery of one prototype.

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b. [REDACTED] expended.

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c. [REDACTED] now estimated required to complete prototype, but not installation ([REDACTED]) and testing ([REDACTED])

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SECRET

**SECRET**

3

**CHAL-0603**

25X1

d. There thus would remain about [ ] which could be used towards purchase of additional equipments.

7. Whereas it probably would be desirable to inquire of the Services whether they would or could contribute to these costs, it seems clear that the rationale for the Agency bearing the costs in the interest of the community is not unlike other projects undertaken in the overflight field. There are no new read-out equipment costs. Cost of purchase after prototype would be on the order of [ ] with [ ] installation per airplane.

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8. There is clearly a need for the use of this equipment in the [ ] from which it would be possible to collect signals against manufacturing and R&D in the [ ] area. There is also a use on [ ]. An assessment has not yet been but will be made as to the aircraft in which this equipment might be best put for peripheral ferret to be operated in what area for the greatest profit.

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9. The undersigned is proceeding to discuss with the Army, Navy, and Air Force their willingness to contribute to remaining costs in development of prototype and in possible procurement. It may well be that other elements of the Agency would be able to fund purchase of certain equipment.

10. Recommendation: That DPD be authorized to proceed with the development of prototype installation in P2V7 and testing. (Further recommendation from the undersigned on interest of the Services and other Agency components in participating in purchase or funding will be provided.)

#### ALQ-28

11. The ALQ-28 is a superheterodyne operator manned receiver covering the 50 to 10,750 mc/s portion of the frequency spectrum in 9 tuning units. It is to be used as a replacement for our present tunable (APR-13 and APR 9) receivers and pulse analyzer and direction finding displays which as a practical matter are not adequate to permit the operator to tune to new and unique signal frequencies. It differs from our present equipment in that it is considerably more sensitive and eliminates the necessity of the operator searching for the exact frequency

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**SECRET**

4

CHAL-0603

of a given signal. This is accomplished by an automatic raster scan feature that displays the output an entire tuner on a 5 inch cathode ray tube swept at a rate of 1.0 SEC per scan. Thus, the "probability of intercept" of a given transmission, of sufficient power to be intercepted, approaches one, and the system capability against unique signals is enhanced many fold. Much of the criticism of ELINT operations is based

25X1 [redacted] However, airborne operators are forced into such collection [redacted]

25X1 [redacted], on equipment such as APR-13a and APR-9a as opposed to the ease with which they can intercept and "work" known signals. The entire purpose of the ALQ-28 in the P2V7 configuration is to overcome this deficiency and for the [redacted]

25X1 12. The ALQ-28 can be used in any aircraft suited for operator manned ELINT operations. There is no airborne receiver in existence with the capabilities of the ALQ-28 which is now a fully tested and approved piece of standard AN gear (Navy).

13. While the ALQ-28 can be of great use to ELINT analysis especially in attacking possible new Soviet electronic development, it does not rank in importance with the K-band tunable receiver. If it were to be used, the order of priority for areas for use would probably be (subject, of course, to check with consumers which has not been done):

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5

CHAL-0603

c. CHICOM. (While unique signals might be uncovered here and if so would be of considerable significance, we do not expect this to be an area nearly as profitable for search of new and unusual signals.)

14. Recommendation: That a decision as to whether ALQ-28s should be installed in P2V7s be postponed pending the undersigned reporting as soon as feasible on the consumer view of the importance in the total ELINT picture of the information collectible by ALQ-28.

*James P. Bissell* 25X1  
[Redacted Signature Box]

DPD-DD/P

cc: ESO (cy 3) 25X1  
ED/OSI ([Redacted]) (cy 4)

Recommendations in paragraphs 10 and 14  
APPROVED:

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RICHARD M. BISSELL, JR.  
Deputy Director  
(Plans)

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Ch SRS/DPD-DD/P: [Redacted] cw  
Cy 1&2-Addressee  
5-Actg Ch/DPD-DD/P  
6-Ch Ops/Ops Br/DPD-DD/P  
7-R&D Br/DPD-DD/P  
8-Ch SRS/DPD-DD/P

Navy has expressed no interest in P2V7 other than an aircraft with sidelooking radar configuration. With reference to Navy personnel, these are on loan to train USAF flight line maintenance personnel and will remain until June 1959. In the Far East Navy personnel are working, but on the same basis.

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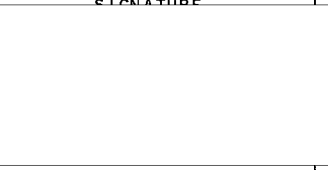
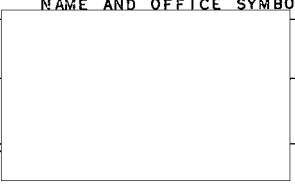
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